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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

SAXENA, AKASH

ART UNIT	PAPER NUMBER
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2128

DATE MAILED: 09/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/673,507	Applicant(s) STRANG, ERIC J.	
	Examiner Akash Saxena	Art Unit 2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-78 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-78 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>12/9/03</u> . | 6) <input type="checkbox"/> Other: _____ |



DETAILED ACTION

1. Claims 1-78 have been presented for examination based on the application filed on 30th September 2003.

Claim Objections

2. Claim 21 is objected to as it is shown as being dependent on itself. Further, confirmation is requested that claim 32 as shown is dependent on claim 21.

Claim Interpretation

3. Claim 21 is interpreted to be dependent from claim 20 going forward.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claim 78 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 78 discloses "computer readable medium" which is defined in the specification (Pg.32-33 [00103] Line1-9) to include tangible items ("non volatile media" and "volatile media") and items that are non-tangible ("transmission media"). Therefore the claim as whole is not directed towards a tangible medium. One possible suggested way to overcome this rejection is to replace "computer readable medium" with "non volatile media" and "volatile media".

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claim 1 provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/673,583.

Application No. 10/673,507	Application No. 10/673,583
A method of <u>controlling</u> a process performed by a semiconductor processing tool, comprising:	A method of <u>facilitating</u> a process performed by a semiconductor processing tool, comprising:
inputting data relating to a process performed by the semiconductor processing tool;	inputting data relating to a process performed by the semiconductor processing tool;
inputting a first principles physical model relating to the semiconductor processing tool;	inputting a first principles physical model relating to the semiconductor processing tool;
performing first principles simulation using the input data and the physical model to provide a <u>first principles simulation result</u> ; and	performing first principles simulation using the input data and the physical model to provide a <u>virtual sensor measurement relating to the process performed by the semiconductor processing tool</u> ; and
using the <u>first principles simulation result to control</u> the process performed by the semiconductor processing tool.	using the <u>virtual sensor measurement to facilitate</u> the process performed by the semiconductor processing tool.

Although the conflicting claims are not identical, they are not patentably distinct from each other because both the virtual sensor measurements are the same simulation result (Specification: Page 13[0051] Last sentence). This is a provisional

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obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

6. **Claim 1 provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/673,501.**

Application No. 10/673,507	Application No. 10/673,501
A method of <u>controlling</u> a process performed by a semiconductor processing tool, comprising:	A method of <u>facilitating</u> a process performed by a semiconductor processing tool, comprising:
inputting data relating to a process performed by the semiconductor processing tool;	inputting data relating to a process performed by the semiconductor processing tool;
inputting a first principles physical model relating to the semiconductor processing tool;	inputting a first principles physical model relating to the semiconductor processing tool;
performing first principles simulation using the input data and the physical model to provide a <u>first principles simulation result</u> ; and	performing first principles simulation using the input data and the physical model to provide a <u>simulation result for the process performed by the semiconductor processing tool</u> ; and
using the <u>first principles simulation result</u> to control the process performed by the semiconductor processing tool.	using the <u>simulation result as part of a data set that characterizes</u> the process performed by the semiconductor processing tool.

Although the conflicting claims are not identical, they are not patentably distinct from each other because both claims perform the same steps and use the simulation result to control the semiconductor-processing tool. Characterization is similar to controlling (Specification: Page 6[0032]). This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

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7. Claim 1 provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of copending Application No. 10/673,138.

Application No. 10/673,507	Application No. 10/673,138
A method of <u>controlling</u> a process performed by a semiconductor processing tool, comprising:	A method of <u>facilitating</u> a process performed by a semiconductor-processing tool, comprising:
inputting data relating to a process performed by the semiconductor processing tool;	inputting data relating to a process performed by the semiconductor processing tool;
inputting a first principles physical model relating to the semiconductor processing tool;	inputting a first principles physical model relating to the semiconductor processing tool;
performing first principles simulation using the input data and the physical model to provide a first principles simulation result; and	performing first principles simulation using the input data and the physical model to provide a first principles simulation result; and
using the first principles simulation result to <u>control</u> the process performed by the semiconductor processing tool.	using the first principles simulation result to <u>facilitate</u> the process performed by the semiconductor processing tool.

Although the conflicting claims are not identical, they are not patentably distinct from each other because both claims perform the same steps and use the simulation result to control/facilitate the semiconductor-processing tool. Facilitating is also similar to controlling (Specification: Page 6[0032]). This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Further, all the three non-statutory obviousness-type double patenting rejections for the application have substantially same or identical specification. Also, independent claims belonging different statutory category, having substantially similar limitations, in the three co-pending applications may also have similar double patenting rejections.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

- 8. Claims 1-21, 29-30, 32-34, 37, 38-58, 66-67, 69-71, and 74 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,802,045 issued to Sonderman et al (Sonderman hereafter).**

Regarding Claim 1

Sonderman teaches a method to controlling a process performed by a semiconductor-processing tool (Sonderman: Summary, at least in Col.2 Lines 10-17; Col.3 Lines 45-49) by inputting data relating to the process performed by the semiconductor-processing tool (Sonderman: at least in Col.3 Lines 50-67). Further, Sonderman teaches inputting the first principle physical model relating to the semiconductor-processing tool (Sonderman: at least in Col.5 Lines 11-17; 49-67) as device physics model, a process model and an equipment model. Further, Sonderman teaches performing first principle simulation using the input data and the physical model to provide simulation results for the process performed by the semiconductor-processing tool (Sonderman: at least in Col.5-7). Further, Sonderman teaches using the first principle simulation results to control the process

performed by the semiconductor-processing tool (Sonderman: at least in Col.4 Lines 48-64; Fig.1-8; Col.2 Lines 10-17).

Regarding Claim 2

Sonderman teaches directly inputting the data relating to the process performed by the semiconductor-processing tool from at least one of physical sensor (eg.

Scatterometry data, overlay data, dimensional data) and a metrology tool physically mounted on the semiconductor-processing tool (Sonderman: at least in Col.4 Lines 31-48; Col.4-8; Fig.1, 7).

Regarding Claims 3-5

Sonderman teaches indirectly inputting the data relating to the process performed by the semiconductor-processing tool from one of the manual input devices and a database as manual fashion data retrieval and automatic data retrieval; inputting data recorded from the previous run; inputting the data set by a simulation operator ((Sonderman: at least in Fig.1-3 Col.1; Col.4-7).

Regarding Claims 6-9

Sonderman teaches inputting data relating to at least one of the physical characteristics of the semiconductor-processing tool and semiconductor tool environment, data relating to at east on of the characteristics and a result of a process performed by the semiconductor processing tool; inputting a spatially resolved model (as modified models) of the geometry of the semiconductor processing tool; inputting fundamental equations necessary to perform first principle

simulation for the desired simulation result (Sonderman: at least in Col.5 Lines 10-18; Col.6 Lines 48-63; Col.9 (equations); Col.5-9; Fig 1-3).

Regarding Claim 10

Sonderman teaches performing interaction concurrently between the simulation environment (first principle simulation) and the semiconductor-processing tool (Sonderman: Fig.2; Col.4 Lines 48-63).

Regarding Claims 11-13

Sonderman teaches performing first principle simulation independent of the process performed by the semiconductor-processing tool; inputting data from to set initial & boundary condition on the first simulation model (Sonderman: at least in Col.5-8; Fig.3-4).

Regarding Claim 14

Sonderman teaches using the first principles simulation result comprises using the first principles simulation result to perform at least one of detecting, and classifying a fault in the process performed by the semiconductor-processing tool (Sonderman: at least in Col.5 Line 56 – Col.6 Line 24).

Regarding Claims 15-19

Sonderman teaches using a network of interconnected resources to perform at least one of the process steps recited in claim 1; using code parallelization among interconnected computational resources to share the computational load of the first principle simulation; sharing simulation information among the interconnected resources to facilitate a process by the semiconductor-processing tool; sharing

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simulation results among the interconnected resources to reduce redundant execution of substantially similar first principle simulation by different resources; sharing information comprising model changes among the interconnected resources to reduce the redundant refinements of first simulation by different resources (Sonderman: Fig.1-3, computer code software is described in Col.9 Lines 58 onward; Col.5-8).

Regarding Claims 20-21

Sonderman teaches remote access to computational and storage resources (Sonderman: Col.9 Line 58-Col.10 Line 31) where in wide area network is art inherent.

Regarding Claim 29

Sonderman teaches performing a principle components analysis to determine a relationship between spatial components of said first principles simulation result for the semiconductor processing tool and a set of at least one control variable, said relationship utilized to determine a correction to said set of at least one control variable in order to affect a reduction in the magnitude of said spatial components (Sonderman: Col.5 Line 56 – Col.6 Line 23).

Regarding Claim 30

Sonderman teaches first principle simulation controlling at least one of a material processing system, an etch system, a photoresist spin coating system, a lithography system, a dielectric coating system, a deposition system, a rapid thermal processing

system for thermal annealing, and a batch diffusion furnace (Sonderman: at least in Col 4 Lines 18-31; Col.3 Lines 45-49).

Regarding Claim 32

Sonderman teaches inputting various parameters relating to etching, deposition etc. (Sonderman: at least in Col.5 Lines 56-67)

Regarding Claim 33

Sonderman teaches inputting physical geometric data as parameters for the equipment model where the equipment could be at least one of a material processing system, an etch system, a photoresist spin coating system, a lithography system, a dielectric coating system, a deposition system, a rapid thermal processing system for thermal annealing, and a batch diffusion furnace (Sonderman: Col.5 Lines 56-67).

Regarding Claim 34

Sonderman teaches first principles simulation result controlling the semiconductor processing tool by using model output to adjust said process performed by the semiconductor processing tool (Sonderman: Col.4 Lines 48-64; Fig.1-2).

Regarding Claim 37

Sonderman teaches inspecting process results and providing input to the first principles simulation for calibration purposes (Sonderman: Col.6 Lines 14-24).

Regarding Claim 38

System claim 38 discloses similar limitations as claim 1 and is rejected for the same reasons as claim 1.

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Regarding Claim 39

System claim 39 discloses similar limitations as claim 2 and is rejected for the same reasons as claim 2.

Regarding Claims 40-42

System claims 40-42 disclose similar limitations as claims 3-5 and are rejected for the same reasons as claims 3-5 respectively.

Regarding Claims 43-46

System claims 43-46 disclose similar limitations as claims 6-9 and are rejected for the same reasons as claims 6-9 respectively.

Regarding Claim 47

System claim 47 discloses similar limitations as claim 10 and is rejected for the same reasons as claim 10.

Regarding Claims 48-50

System claims 48-50 disclose similar limitations as claims 11-13 and are rejected for the same reasons as claims 11-13 respectively.

Regarding Claim 51

System claim 51 discloses similar limitations as claim 14 and is rejected for the same reasons as claim 14.

Regarding Claims 52-56

System claims 52-56 disclose similar limitations as claims 15-19 and are rejected for the same reasons as claims 15-19 respectively.

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Regarding Claims 57-58

System claims 57-58 disclose similar limitations as claims 20-21 and are rejected for the same reasons as claims 20-21 respectively.

Regarding Claim 66

System claim 66 discloses similar limitations as claim 29 and is rejected for the same reasons as claim 29.

Regarding Claim 67

System claim 67 discloses similar limitations as claim 30 and is rejected for the same reasons as claim 30.

Regarding Claim 69

System claim 69 discloses similar limitations as claim 32 and is rejected for the same reasons as claim 32.

Regarding Claim 70

System claim 70 discloses similar limitations as claim 33 and is rejected for the same reasons as claim 33.

Regarding Claim 71

System claim 71 discloses similar limitations as claim 34 and is rejected for the same reasons as claim 34.

Regarding Claim 74

System claim 74 discloses similar limitations as claim 37 and is rejected for the same reasons as claim 37.

Regarding Claim 75

System claim 75 discloses similar limitations as claim 1 and is rejected for the same reasons as claim 1.

Regarding Claim 76

System claim 76 discloses similar limitations as claim 16 and is rejected for the same reasons as claim 16.

Regarding Claim 77

System claim 77 discloses similar limitations as claim 17 and is rejected for the same reasons as claim 17.

Regarding Claim 78

Article of manufacture claim 78 discloses similar limitations as claim 1 and is rejected for the same reasons as claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

- 4. Claims 22 and 59 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,802,045 issued to Sonderman et al (Sonderman hereafter), in view of IEEE article “Heat Analysis on Insulated Metal Substrates” by Naomi Yunemura et al (Yunemura hereafter).**

Regarding Claim 22

Teachings of Sonderman are disclosed in claim 1 rejection above. Sonderman also teaches that the first principle simulation models the equipment conditions, thereby modeling temperature response and pressure response during various processes (Sonderman: at least in Col.5 Lines 62-67).

Sonderman does not teach explicitly that such temperature and pressure modeling is done using ANSYS computer code.

Yunemura teaches that heat simulation modeling can be performed using ANSYS computer code (Yunemura: Pg. 1407 Section 1) on a silicon chip.

It would have been obvious to one (e.g. a designer) of ordinary skill in the art at the time the invention was made to apply the teachings of Yunemura to Sonderman to create a equipment model as disclosed by Sonderman. The motivation to combine would have been that Yunemura teaches heat modeling on a silicon chip affecting the thermal conductivity (Yunemura: Pg.1407 Section 2) based on various thicknesses and Sonderman is solving the same issue for the equipment model that for example model the equipment for depositing the various layers and affects on heat and pressure. Further, ANSYS is known in art to be used as thermal & pressure modeling tool based on finite element analysis.

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Regarding Claim 59

System claim 59 discloses similar limitations as claim 22 and is rejected for the same reasons as claim 22.

- 5. Claims 23-28 and 60-65 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,802,045 issued to Sonderman et al (Sonderman hereafter), in view of U.S. Patent No. 5,719,796 issued to Vincent M.C. Chen (Chen hereafter).**

Regarding Claims 23-25

Teachings of Sonderman are disclosed in claim 1 rejection above.

Sonderman does not explicitly teach close fitting the solution of the first principle simulation run to thereby set initial conditions for cells in the first principle simulation; selecting close fitting solutions from a library based on convergence.

Chen teaches close fitting the solution of the first principle simulation run to thereby set initial conditions for cells in the first principle simulation; selecting close fitting solutions from a library based on convergence (Chen: at least in Col.5 Lines 38 – Col.6 Line 25; Fig 3A-B).

It would have been obvious to one (e.g. a designer) of ordinary skill in the art at the time the invention was made to apply the teachings of Chen to Sonderman. The motivation to combine would have been that Chen and Sonderman both are analogous art concerned with simulating the semiconductor fabrication process and providing the best control parameters to the actual semiconductor-processing tool (Chen: at least in Col.3 Lines 19-23).

Regarding Claim 26

Chen teaches that the close-fitting solution library existing on a network of computers connected to semiconductor-processing tool (Chen: Fig.2; Col.4 Line 55 –Col.6 Line 19).

Regarding Claims 27-28

Chen teaches calculating solution to the first principle simulation by choosing a coarse grid for solution to the first principle simulation (Chen: at least in Col.6 Line 44-Col.7 Line 14) as user defined parameters; further, subsequent solutions by setting the initial conditions to fine grid are made though Gaussian distribution and actual inline data (Chen: at least in Col.6 Line 46-51).

Regarding Claims 60-62

System claims 60-62 disclose similar limitations as claims 23-35 and are rejected for the same reasons as claims 23-25 respectively.

Regarding Claim 63

System claim 63 discloses similar limitations as claim 26 and is rejected for the same reasons as claim 26.

Regarding Claims 64-65

System claims 64-65 disclose similar limitations as claims 27-28 and are rejected for the same reasons as claims 27-28 respectively.

- 6. Claims 31, 36, 68 and 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,802,045 issued to Sonderman et al (Sonderman hereafter), in view of U.S. Patent No. 6,812,045 issued to Mehrdad Nikoonahad (Nikoonahad hereafter).**

Regarding Claim 31

Teachings of Sonderman are disclosed in claim 1 rejection above. Sonderman provides examples of the processing tool as etch and photolithography tools (Col.4 Lines 26-31) but does not explicitly disclose chemical vapor and physical vapor deposition system.

Nikoonahad teaches deposition tools to include chemical vapor and physical vapor deposition system (Nikoonahad: Col.24 Lines 3-49).

It would have been obvious to one (e.g. a designer) of ordinary skill in the art at the time the invention was made to apply the teachings of Nikoonahad to Sonderman. The motivation to combine would have been that Nikoonahad and Sonderman are analogous art and both are modeling the semiconductor processing and providing feedback to the semiconductor processing tool (Sonderman: Abstract; Nikoonahad: Col.3; Col.93 Lines 20-35).

Regarding Claim 36

Nikoonahad teaches plurality of computing (as processor)/ storage (as memory) devices connected over network to exchange information between a plurality of computing/storage devices including at least one of model solver parameters, solution status to the first principles simulation, model solutions to the first principles simulation, and solution convergence history for said model solutions (Nikoonahad: Col.3 Lines 15-44; Col.68, Lines 41-59).

Regarding Claim 68

System claim 68 discloses similar limitations as claim 31 and is rejected for the same reasons as claim 31.

Regarding Claim 73

System claim 73 discloses similar limitations as claim 36 and is rejected for the same reasons as claim 36.

7. Claims 35 and 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,802,045 issued to Sonderman et al (Sonderman hereafter), in view of U.S. Application 10/472,436 filed by David Fatke et al. (Fatke hereafter).

Regarding Claim 35

Teachings of Sonderman are disclosed in claim 1 rejection above.

Sonderman does not teach step of controlling by utilizing at least on of non-linear optimization and multivariate analysis to derive the control model for the process control.

Fatke teaches utilizing at least on of non-linear optimization and multivariate analysis to derive the control model for the process control (Fatke: [0011][0012][0035][0050]-[0058][0021]). Fatke uses the partial least square (PLS) model to perform multivariate analysis ([0050] to derive the control model for the process control and provide output to the semiconductor-processing tool ([0021]). Further, Fatke teaches that the nonlinear optimization is known in the art for creating such models ([0012]).

It would have been obvious to one (e.g. a designer) of ordinary skill in the art at the time the invention was made to apply the teachings of Fatke to Sonderman. The motivation to combine would have been that Fatke and Sonderman are analogous art and Fatke creates a model form the determining the endpoint of the etching in an etch reactor (Fatke: Abstract/Summary), thereby creating a equipment model and the process model for etching, which can be applied to Sonderman.

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Regarding Claim 72

System claim 72 discloses similar limitations as claim 35 and is rejected for the same reasons as claim 35.

Conclusion

8. All claims are rejected.
9. **Examiner's Note:** Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant.

Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.

In the case of amending the claimed invention, Applicant is respectfully requested to indicate the portion(s) of the specification which dictate(s) the structure relied on for proper interpretation and also to verify and ascertain the metes and bounds of the claimed invention.

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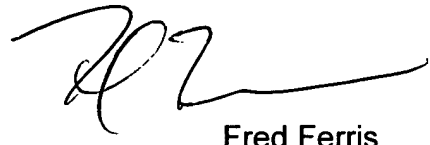
Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Akash Saxena whose telephone number is (571) 272-8351. The examiner can normally be reached on 8:30 - 5:00 PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jean R. Homere can be reached on (571)272-3780. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Akash Saxena
Patent Examiner GAU 2128
(571) 272-8351
Tuesday, September 13, 2005



Fred Ferris

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